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HOGAN & HARTSON L.L.P.
500 S. GRAND AVENUE
SUITE 1900
LOS ANGELES, CA 90071-2611

EXAMINER

VIDWAN, JASJIT S

ART UNIT

PAPER NUMBER

2182

DATE MAILED: 02/09/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/783,337

Applicant(s)

ARAI ET AL.

Examiner

Jasjit S. Vidwan

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 April 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 2/1/06.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claims 1-20 are pending

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 9, 13, and 18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Applicant fails to particularly point out and distinctly define what "inter-disk copy command" means in the specification. For the reasons of timely examination of the application, the Examiner will interpret "inter-disk copy command" to be limited to copying of data from one storage disk to another.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) The invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 2, 3, 5, 7, 8, 10, 11, 12, 14, 15, 16, 17, 19, 20 are rejected under 35 U.S.C. 102(b) as being anticipated by Yatziv, U.S. Pub no: 2002/0062387 (herein after Yatziv).

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3. **As per claims 1, 7, 10, 14, and 19** Yatziv teaches a disk array system (see Fig.

1, "Storage system") comprising:

- a. At least one ATA magnetic disk (see Fig. 1, elements 130a-130d)
- b. At least one disk array controller for controlling the ATA magnetic disks (see Fig. 1, element 110, "Array Controller")
- c. At least one interface card having a processing offload function module (see Fig. 2, element 220, "State Machine"), existing on a path between the disk array controller and the ATA magnetic disk (See Fig. 1, element 120, "Interface Adapter")
- d. Wherein the disk array controller outputs to the interface card (see "Detailed Description", Page 3, Paragraph 0023, "Interface adapter is configured to receive FC communications from array controller") one of a standard processing FC command for performing a standard processing (Page 3, Paragraph 0025, Lines 15-19, Examiner understands Applicant's teaching as follow: Page 7, Line 20 defines standard processing FC command as a basic read or write command which Yatziv teaches by reading data out of the storage devices), and an offload processing FC command for performing a vendor-unique offload processing (see Fig. 6, element 612).
- e. The processing offload function module (see Fig. 2, element 220, "State Machine") uses a command-mapping table to issue to the ATA magnetic disk an ATA command that corresponds to the standard processing FC command (see Page 2, paragraph 0023).

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4. **As per claim 2, 11, 15, 17, 20**, Yatziv teaches a disk array system (Fig. 1, element 106) wherein the processing offload function module prepares a group of ATA commands for the offload processing FC command (see Fig. 6, element 612) which achieve optimal processing in an ATA protocol, and computes when necessary (see Page 2, paragraph 0023, Examiner understands Yatziv's teaching as follow: Yatziv teaches a system wherein FC commands are converted into appropriate ATA commands to be outputted to ATA magnetic disks. In order for this process to occur, there preexists a group of ATA commands that match up with their appropriate FC commands. Therefore the combination of the two protocols will yield an optimal processing during the FC/ATA command conversion).

5. **As per claim 3, 8, 12, 16** Yatziv teaches a system wherein the processing offload function module includes a command analysis processing section and an operation processing section, wherein the command analysis processing section determines whether the standard processing FC command sent from the disk array controller can be mapped onto an ATA command, and the operation processing section takes over the offload processing FC command from the command analysis processing section and prepares the group of ATA commands (Page 2, Paragraph 0023, Examiner understands the teaching as follow: In order for an FC/ATA command conversion to take places, there exists an appropriate ATA command that matches with the FC command output by the Storage array controller. If there is no ATA command that is equivalent to the FC command, no action will take place. However, if an ATA equivalent command exists, the requested conversion will be processed).

6. **As per claim 5**, Yatziv teaches a system wherein the offload processing FC command is a write with parity computation, the operation processing section issues a read command to read from the ATA magnetic disk, executes a parity computation, and issues a write command to write in the ATA magnetic disk (Page 4, Paragraph 0042, "error check", Examiner construes Yatziv's teaching as follow: Yatziv teaches a system wherein the bus system for data transfer can be configured to include parity check during write with parity computation (vendor unique FC command). Therefore there exists functionality in Yatziv's storage apparatus to read or write from the storage disks with the benefit of parity check calculations).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. **Claim 4** is rejected under 35 U.S.C. 103(a) as being unpatentable over Yatziv U.S. Pub No: 2002/0062387 (herein after Yatziv) and further in view of Braddy U.S. Patent No: 6,141,759 (herein after Braddy).

Yatziv teaches the limitations of claim 3 wherein there exists a storage system apparatus consisting of a host (Fig. 1, element 100), Array Controller (Fig. 1, element 110), Interface Adapter (Fig. 1, element 120), and plurality of ATA storage disks (Fig. 1, element 130a-d). In addition, Yatziv teaches an Interface adapter consisting of an offload function module (see Fig. 2, element 220, "State Machine").

Yatziv fails to teach a system wherein the Array controller checks to determine whether there exists an Offload function module prior to relaying any commands to perform an offload function off any number of ATA disks. However, Braddy teaches a system wherein a controller determines whether the second system can handle the request (see Braddy, Fig. 8, element 208).

One of ordinary skill in the art at the time of applicant's invention would have clearly recognized that it is quite advantageous to include this functionality of checking the existence of particular system hardware prior to performing a requesting a task from the said hardware in order to avoid a system failure. It is for this reason that one of ordinary skill in the art would have been motivated to substitute Braddy's teaching with Yatziv in order to provide system stability by discriminating whether the system can handle a particular request (i.e. determine whether the hardware to perform a said task even exists).

9. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yatziv U.S. Pub No: 2002/0062387 (herein after Yatziv) and further in view of Konno U.S. Patent No: 5,835,703 (herein after Konno).

10. **As per claim 6**, Yatziv teaches the limitations of claim 3, however Yatziv fails to teach a system wherein a read command could be simultaneously issued to a plurality of magnetic disks corresponding to Identification provided in a list by the disk array controller. However, Konno teaches a system wherein plurality of magnetic disks can be accessed simultaneously through their respective address (see Konno, Col. 13, Lines 25-30).

One of ordinary skill in the art at the time of applicant's invention would have clearly recognized that it is quite advantageous for a system to be able to access plurality of disks concurrently in order to have more efficient processes. It is for this reason that one of ordinary skill in the art would have been motivated to substitute Konno's teachings with that of Yatziv in order to achieve optimum process.

11. As far as the examiner can interpret the claims in light of the 35 USC 112 Rejection, Supra, claim 9, 13, 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yatziv U.S. Pub No: 2002/0062387 (herein after Yatziv) and further in view of Konno U.S. Patent No: 5,835,703 (herein after Konno).

12. **As per claim 9, 13 and 18**, Yatziv teaches the limitations of claim 8, 12 and 17, and further teaches three types of FC commands including write command with parity computation (Col. 4, Paragraph 0042, "error checking"), RAID format command (Col. 3, Paragraph 0024) and inter-disk copy command (Page 4, Paragraph 0035, Examiner understands the teaching as follow: Yatziv's system uses registers to read/write data to/from the storage devices. Therefore, in order to copy data from one storage disk to another, Yatziv's system would require the data to be read into the register from storage disk A and then written to storage disk B by reading it from the register).

Yatziv fails to teach a system wherein commands could also consist of online multiple disk verification command. However, Konno teaches the multiple disk verification command (see Konno, Col. 13, Lines 25-30). One of ordinary skill in the art at the time of applicant's invention would have clearly recognized that it is quite advantageous to include multiple disk verification command functionality in addition to

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the other three in order for a system to be able to access plurality of disks concurrently in order to have more efficient processes. It is for this reason that one of ordinary skill in the art would have been motivated to substitute Konno's teachings with that of Yatziv in order to achieve optimum process.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jasjit S. Vidwan whose telephone number is (571) 272-7936. The examiner can normally be reached on 8am - 5 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, KIM HUYNH can be reached on (571) 272-4147. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JSV
2/1/06


KIM HUYNH
SUPERVISORY PATENT EXAMINER

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